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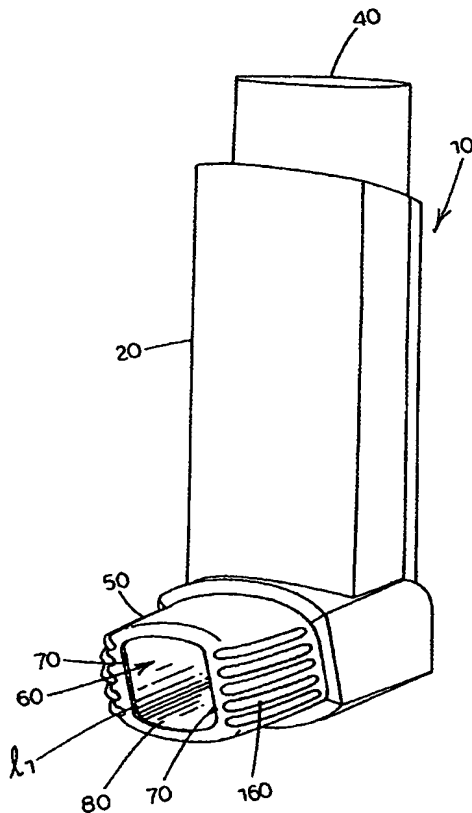
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| <p>(51) <b>International Patent Classification<sup>7</sup>:</b> <b>A61M 11/00,</b><br/>15/00, 16/00</p> <p>(21) <b>International Application Number:</b><br/>PCT/US2003/038483</p> <p>(22) <b>International Filing Date:</b> 4 December 2003 (04.12.2003)</p> <p>(25) <b>Filing Language:</b> English</p> <p>(26) <b>Publication Language:</b> English</p> <p>(30) <b>Priority Data:</b><br/>60/434,517      18 December 2002 (18.12.2002)      US</p> <p>(71) <b>Applicant (for all designated States except US):</b> <b>GLAXO GROUP LIMITED</b> [GB/GB]; Glaxo Wellcome House, Berkeley Avenue, Greenford, Middlesex UB6 0NN (GB).</p> <p>(72) <b>Inventor; and</b></p> <p>(75) <b>Inventor/Applicant (for US only):</b> <b>KING, Michael, L.</b> [US/US]; 3229 Lochinvar Drive, Durham, NC 27705 (US).</p> | <p>(74) <b>Agents:</b> <b>LEVY, David, J.</b> et al.; GlaxoSmithKline, Corporate Intellectual Property Department, Five Moore Drive, P.O. Box 13398, Research Triangle Park, NC 27709 (US).</p> <p>(81) <b>Designated States (national):</b> AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.</p> <p>(84) <b>Designated States (regional):</b> ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).</p> |
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*[Continued on next page]*

- (54) Title:** DRUG DELIVERY SYSTEM WITH VENTED MOUTHPIECE



**(57) Abstract:** An oral inhaler suitable for delivering a pharmaceutical formulation to a patient comprises a container having the pharmaceutical formulation comprising at least one medicament present therein, and a mouthpiece configured for oral engagement with a patient and in communication with the container, the mouthpiece having an inner surface and an outer surface; wherein the outer surface of the mouthpiece contains at least one longitudinally-extending disuniformity such that when the patient orally engages the mouthpiece at least one void space is created between the outer surface of the mouthpiece and the oral cavity of the patient so as to provide an air flow channel through the at least one void space to facilitate intake of the at least one medicament by the patient.

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PCT/US03/38483

## A. CLASSIFICATION OF SUBJECT MATTER

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US CL : 128/200.11, 200.12, 200.13, 200.14, 200.23, 203.12, 203.15, 203.21, 203.22

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 128/200.11, 200.12, 200.13, 200.14, 200.23, 203.12, 203.15, 203.21, 203.22

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,390,088 B1 (NOHL et. al.) 21 May 2002 (21.05.2002), See figures 2, 3.	1-4, 6-13, 27, 28
Y		5
Y	US 6,474,331 B1 (RAND et. al.) 05 November 2002 (05.11.2002), See column 9, lines 40-67 and column 10, lines 1-20.	14-26, 29-34

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Further documents are listed in the continuation of Box C.

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See patent family annex.

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document member of the same patent family

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